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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/664,435	09/18/2000	Takashi Iwade	H9876.0055/P055	4783

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EXAMINER
YANG, RYAN R

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/664,435	IWADE ET AL.	
	Examiner	Art Unit	
	Ryan R Yang	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/20/2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6,7,9-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,7 and 10-12* is/are rejected.

7)☒ Claim(s) *3,6 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This action is responsive to communications: Amendment, filed on 2/20/03. This action is final.

2. Claims 1, 3, 4, 6, 7 and 9-12 are pending in this application. Claims 1, 4 and 7 are independent claims. In the Amendment, filed on 2/20/03, claims 1, 3, 4, 6, 7 and 9 were amended, claims 2, 5 and 8 were canceled, and claims 10-12 were added.

This application claims foreign priority dated 9/16/1999.

3. The present title of the invention is "Method of forming polygon image and image processing apparatus using the same" as filed originally.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 4 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawasaki (6,246,414).

As per claim 1, Kawasaki discloses a method of forming a polygon image, comprising the steps of:

obtaining a plurality of polygons having normal line data as apex data and constituting a model (Figure 8 where the apex data is the normal line data at the vertex);

sorting the plurality of polygons into polygons of a first color part and polygons of a second color part along a boundary line according to the direction of a light source and normal lines of the plurality of polygons (Figure 2 18 where the Brightness Calculating Section determine the brightness of the polygon by the angle of the light source and the normal vector, column 6, line 1-2, the polygons are distinguished by those with brightness and those without brightness);

dividing polygons intersecting the boundary line along the boundary line (Figure 6E-6F);

sorting the divided polygons into polygons of the first color part and polygons of the second color part along the boundary line according to the direction of a light source and normal lines of the divided polygons (Figure 2 18 where the Brightness Calculating Section determine the brightness of the polygon by the angle of the light source and the normal vector after dividing up the polygon, Figure 4 S21); and

pasting up the first mono-color texture on the polygons belonging to the first color part and the second mono-color texture on the polygons belonging to the second color part (Figure 4 S24)

5. As per claim 4, Oka discloses an image processing apparatus comprising:

control means for obtaining a plurality of polygons having normal line data as apex data and constituting a model (Figure 8 where the apex data is the normal line data at the vertex);

sorting the plurality of polygons into polygons of a first color part and polygons of a second color part along a boundary line according to the direction of a light source

and normal lines of the plurality of polygons (Figure 2 18 where the Brightness Calculating Section determine the brightness of the polygon by the angle of the light source and the normal vector, column 6, line 1-2, the polygons are distinguished by those with brightness and those without brightness);

dividing polygons intersecting the boundary line along the boundary lines (Figure 6E-6F), and

sorting the divided polygons into polygons of the first color part and polygons of the second color part along the boundary line according to the direction of a light source and normal lines of the divided polygons (Figure 2 18 where the Brightness Calculating Section determine the brightness of the polygon by the angle of the light source and the normal vector after dividing up the polygon, Figure 4 S21); and

a rendering processor for pasting up the first mono-color texture on the polygons belonging to the first color part and the second mono-color texture on the polygons belonging to the second color part (Figure 4 S24).

Regarding the "means plus function" language, the means refer to the software methods executed on generically disclosed hardware explicitly disclosed by Oka. It is further noted that both software and hardware means are functionally equivalent.

6. As per claim 7, since Kawasaki's system is an image processing apparatus with memory (Figure 2 11) it is obvious that his system has the memory containing the program to perform the functions as discloses in claim 1 and, therefore, is similarly rejected as claim 1.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawasaki as applied to claim1 above, and further in view of Gelb et al. (6,515,674).

9. As per claim 10, Kawasaki demonstrated all the elements as applied to the rejected independent claim 1, supra.

Kawawsaki discloses a method of forming a polygon image by sorting and subdividing a plurality of polygons into two colors. It is noted that Kawasaki does not explicitly disclose the step of acquiring inner product values of the direction of a light source and normal line of the divided polygons, wherein the polygons intersecting the boundary line are determined as polygons having different polarities of the acquired inner product values, however, this is known in the art as taught by Gelb et al., hereinafter Gelb. Gelb discloses a method of rendering polygons in which a D parameter is derived to decide if the polygons is facing front or back of the light source ("The third parameter D is typically the result of projecting he user-defined vector onto the vertex normal vectors. For front facing polygons, D will be positive and for back facing polygons, D will be negative", column 6, line 45-48).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Gelb into Kawasaki because Kawasaki discloses a method of forming a polygon image and Gelb discloses the polygon is to be shaded by calculating the inner product of the light vector and the polygon normal in order to determine the orientation of the polygon.

10. As per claim 11, Kawasaki demonstrated all the elements as applied to the rejected independent claim 4, supra.

Kawawsaki discloses a method of forming a polygon image by sorting and subdividing a plurality of polygons into two colors. It is noted that Kawasaki does not explicitly disclose the step of acquiring inner product values of the direction of a light source and normal line of the divided polygons, wherein the polygons intersecting the boundary line are determined as polygons having different polarities of the acquired inner product values, however, this is known in the art as taught by Gelb et al., hereinafter Gelb. Gelb discloses a method of rendering polygons in which a D parameter is derived to decide if the polygons is facing front or back of the light source ("The third parameter D is typically the result of projecting he user-defined vector onto the vertex normal vectors. For front facing polygons, D will be positive and for back facing polygons, D will be negative", column 6, line 45-48).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Gelb into Kawasaki because Kawasaki discloses a method of forming a polygon image and Gelb discloses the

polygon is to be shaded by calculating the inner product of the light vector and the polygon normal in order to determine the orientation of the polygon.

11. As per claim 12, since Kawasaki and gelb's system is an image processing apparatus with memory (Figure 2 11) it is obvious that his system has the memory containing the program to perform the functions as discloses in claim 10 and, therefore, is similarly rejected as claim 10.

Allowable Subject Matter

12. Claims 3, 6 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As per claims 3, 6 and 9, the closest prior art by Kawasaki and Gelb do not disclose the intersectional position of a side line of a polygon intersecting the boundary line is acquired from a proportional relation with the inner product value of two apexes of the side line of the polygon intersecting the boundary lines when the inner product value at the intersectional position is set "0" in sorting polygons.

Response to Arguments

13. Applicant's arguments with respect to claims 1, 4, 7 and 10-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Ryan Yang** whose telephone number is **(703) 308-6133**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Michael Razavi**, can be reached at **(703) 305-4713**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 305-47000377.

Ryan Yang
April 10, 2003

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600